AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims.

1. (Currently Amended) An active magnetic bearing with autodetection of position, the bearing comprising at least first and second opposing electromagnets forming stators disposed on either side of a ferromagnetic body forming a rotor and held without contact between said electromagnets, the first and second electromagnets each comprising a magnetic circuit essentially constituted by a first portion comprising a first ferromagnetic material and co-operating with said ferromagnetic body to define an airgap, together with an excitation coil powered from a power amplifier whose input current is servo-controlled as a function of the position of the ferromagnetic body relative to the magnetic circuits of the first and second electromagnets, the position of the ferromagnetic body being measured from the inductance detected between the two electromagnets in response to simultaneous injection into both opposing electromagnets of a sinusoidal current at a frequency that is greater than the closed loop passband of the system,

the bearing being characterized in that the magnetic circuit of each electromagnet further includes a second portion comprising ~~in the vicinity of the excitation coil that uses~~ a second ferromagnetic material having magnetic permeability that is lower than that of the first ferromagnetic material and electrical resistivity that is higher than that of the first ferromagnetic material so as to encourage the passage of the high frequency magnetic fields that are generated in the bearing,

wherein the second portion is located between the first portion and the excitation coil.

2. (Currently Amended) A bearing according to claim 1, characterized in that the ~~low permeability and high resistivity~~ second portion is formed by a piece made of powder comprising grains of magnetic material that are electrically insulated from one another.

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3. (Original) A bearing according to claim 2, characterized in that the powder comprises grains of iron that are electrically insulated from one another.

4. (Currently Amended) A bearing according to claim 1, characterized in that the ferromagnetic body forming the rotor includes at least one portion of ferromagnetic material having magnetic permeability that is ~~smaller~~ lower and ~~of~~electrical resistivity that is greater than ~~the~~a remainder of said body so as to encourage the passage of high frequency magnetic fields, said portion being disposed substantially in register with each of the second portions ~~low permeability and high resistivity portion~~ formed in the electromagnet.

5. (Currently Amended) A bearing according to claim 4, characterized in that the at least one low magnetic permeability and high electrical resistivity portion of the ferromagnetic rotor-forming body is formed by a part made of powder comprising grains of magnetic material that are electrically insulated from one another.

6. (Original) A bearing according to claim 5, characterized in that the powder comprises grains of iron that are electrically insulated from one another.

7. (Currently Amended) A bearing according claim 4, characterized in that the ferromagnetic rotor-forming body includes a stack of ferromagnetic laminations, the laminations present in the low permeability and high resistivity portion ~~presenting~~ each having a thickness that is smaller ~~than the~~ than a thickness of those other laminations in the stack.

8. (Currently Amended) A bearing according to claim 1, characterized in that each of the ~~low permeability and high resistivity portion(s) present(s)~~ second portions presents a magnetic permeability of about 100.

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9. (Currently Amended) A bearing according to claim 1, characterized in that each of the ~~low permeability and high resistivity portion(s) present(s)~~ second portions presents an electrical resistivity of about 50 Ωm.

10. (Previously presented) A bearing according to claim 1, characterized in that the active magnetic bearing is of the axial type.

11. (Previously presented) A bearing according to claim 1, characterized in that the active magnetic bearing is of the radial type.

12. (Currently Amended) A bearing according to claim 3, characterized in that:

the ferromagnetic body forming the rotor includes at least one portion of ferromagnetic material having magnetic permeability that is lower ~~smaller~~ and ~~of~~ electrical resistivity that is greater than ~~the~~a remainder of said body so as to encourage the passage of high frequency magnetic fields, said at least one portion being disposed substantially in register with each of the ~~low permeability and high resistivity portion~~ second portions formed in the electromagnet;

wherein the low magnetic permeability and high electrical resistivity portion of the rotor-forming body is formed by a part made of powder comprising grains of magnetic material that are electrically insulated from one another; and

wherein the powder comprises grains of iron that are electrically insulated from one another.

13. (Currently Amended) A bearing according to claim 4, characterized in that each of the low magnetic permeability and high electrical resistivity ~~portion(s) present(s)~~ portions presents magnetic permeability of about 100.

14. (Currently Amended) A bearing according to claim 7, characterized in that:

each of the low magnetic permeability and high electrical resistivity ~~portion(s) present(s)~~ portions presents magnetic permeability of about 100;

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each of the low magnetic permeability and high electrical resistivity ~~portion(s) present(s)~~ portions presents electrical resistivity of about 50 Ωm; and

the active magnetic bearing is of the axial type.

15. (Currently Amended) A bearing according to claim 7, characterized in that:

each of the low magnetic permeability and high electrical resistivity ~~portion(s) present(s)~~ portions presents magnetic permeability of about 100;

each of the low magnetic permeability and high electrical resistivity ~~portion(s) present(s)~~ portions presents electrical resistivity of about 50 Ωm; and

the active magnetic bearing is of the radial type.

16. (New) A bearing according to claim 1, characterized in that:

the first portion is configured with a U-shaped cross-section; and

the second portion is positioned within the U-shape of the first portion.

17. (New) An active magnetic axial bearing, comprising:

a rotor formed of a ferromagnetic body; and

first and second stators disposed, respectively, on each side of the rotor, each of the first and second stators comprising an excitation coil and first and second portions comprising, respectively, first and second ferromagnetic material,

wherein the second ferromagnetic material has magnetic permeability that is lower than the magnetic permeability of the first ferromagnetic material and the second ferromagnetic material has electrical resistivity that is higher than that of the first ferromagnetic material, and

wherein, in each of the first and second stators, the second portion is located between the first portion and the excitation coil.

18. (New) The active magnetic axial bearing of claim 17, wherein:

the rotor comprises first and second rotor portions of ferromagnetic material that has magnetic permeability that is lower than the magnetic permeability of the first

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ferromagnetic material and that has electrical resistivity that is higher than that of the first ferromagnetic material,

wherein each of the first and second rotor portions is disposed substantially in register with a corresponding respective second portion of one of the first and second stators.

19. (New) An active magnetic radial bearing, comprising:

a stator; and

a rotor configured to rotate relative to the stator,

wherein the stator comprises an excitation coil, a first stator portion comprising first ferromagnetic material comprising a stack of ferromagnetic laminations arranged parallel to an axial length of the rotor and a second stator portion comprising a second ferromagnetic material, the excitation coil surrounding the first and second stator portions, the second stator portion being located between the first stator portion and the excitation coil, and

wherein the second ferromagnetic material of the second stator portion has a magnetic permeability that is lower than a magnetic permeability of the first stator portion and the second ferromagnetic material has an electrical resistivity that is higher than an electrical resistivity of the first stator portion, and

wherein the rotor comprises a first rotor portion and a second rotor portion disposed over an axial length of the rotor and substantially in register with, respectively, the first and second stator portions, and

wherein the second rotor portion has a magnetic permeability that is lower than a magnetic permeability of the first rotor portion and the second rotor portion has an electrical resistivity that is higher than an electrical resistivity of the first rotor portion.

20. (New) The active magnetic radial bearing of claim 19, wherein:

the first rotor portion comprises a first stack of ferromagnetic laminations arranged parallel to the axial length of the rotor, wherein each lamination in the first stack is of a first thickness; and

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the second rotor portion comprises a second stack of ferromagnetic laminations arranged parallel to the axial length of the rotor, wherein each of the laminations in the second stack is of a second thickness,

wherein the second thickness is smaller than the first thickness.

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